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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,299	08/13/2001	Satoh Shinichirou	2001-0535A	2816

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WASHINGTON, DC 20006-1021

EXAMINER

MUNOZ, GUILLERMO

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/831,299

Applicant(s)

SHINICHIROU, SATOH

Examiner

Guillermo Munoz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

Figures 7, 8(a), 8(b), and 8(c) should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it is not limited to a single paragraph. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities: The specification is objected to for including references to the claims, for example page 11, lines 6-8 reference claims 1 and 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchinaga in view of Kayanuma.

Regarding claim 1, Tsuchinaga disclose all the subject matter claimed as follows. Tsuchinaga teach an analog/digital converter in figure 2 element 202; an automatic equalizer in figure 2, element 203; a frequency divider in figure 2 element 209. Tsuchinaga does not explicitly teach phase locked loop, however, the functionality of the phase detector, which generates a phase error signal based on the phase difference of the received signal and a clock signal (Col. 7, lines 46-47), is the same. Tsuchinaga teach interpolating data by processing sub-sampled data in an automatic equalizer, Mid-step decision unit, and a Post Coder, however, Tsuchinaga does not teach the automatic equalizer having a transversal filter, a straight line interpolator, or a control unit.

Kayanuma teach an adaptive traversal filter designed to operate at $\frac{1}{2}$ the channel bit rate having a coefficient controlling circuit designed to adjust the coefficients of the traversal filter based upon a detected error signal, note figure 1, elements 3, 4, 6, and 9; the output signal from the transversal filter 3 is interpolated by an interpolating circuit 4 and outputted.

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Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Tsuchinaga's equalizer with Kayanuma's teaching of using an adaptive traversal filter since Tsuchinaga suggest in Col.8 lines 20-24, using an automatic equalizer having coefficients that can be adaptively set.

Regarding claim 2, Kayanuma does not explicitly teach "flip-flop element", however, the functionality of the 2T delay in element 4 of figure 1 is the same. Further, Kayanuma teach the adder following the 2T delay in element 4 of figure 1.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchinaga in view of Kayanuma and in further view of Spurbeck et al..

Regarding claim 3; as applied to claim 1 above, Kayanuma teach the use of linear interpolation, in which interpolation is carried out using two sample points, however, suggest the interpolation can be improved in page 15, lines 1-9.

Spurbeck et al. teach an interpolation circuit having improved performance when the signal is sampled at a much lower rate than the baud rate. The interpolator is implemented as a nonlinear FIR polynomial, note Col. 11, lines 10-15 and Fig. 7.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kayanuma's interpolator with Spurbeck et al.'s teach of using an interpolator implemented as a nonlinear FIR polynomial, since Spurbeck et al. suggest in Col. 10, lines 19-23, that the modification would result in reduced complexity and cost of the overall system.

Regarding claim 4; Spurbeck et al. does not explicitly teach "flip-flop element", however, the functionality of the delay in element B260 of Fig. 7 is the same. Further, Spurbeck et al.

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teach a "plurality of multipliers" following the delay in element B260 of Fig. 7, and an "adder" following the multipliers in element B260 of Fig. 7.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Munoz whose telephone number is 703-305-4224.

The examiner can normally be reached on Monday-Friday 8:30a.m-4:30p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 703-308-7728. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



GM
July 23, 2004



JEAN B. CORRIELLUS
PRIMARY EXAMINER

7/26/04